

ELLIPTICAL CROSSTRaining EXERCISE MACHINE

REFERENCE TO RELATED APPLICATION

The present application is a utility application based upon Provisional application Serial No. 60/477,859, filed June 11, 2003.

TECHNICAL FIELD OF THE INVENTION

The present invention relates generally to a exercise machines and , more particularly, to an elliptical crosstraining apparatus having footrest support members that are functionally decoupled from one another.

BACKGROUND OF THE INVENTION

Elliptical exercise training is a relatively new and popular exercise option. In elliptical training, exercisers use elliptical running machines to get a total-body workout and improve muscle tone and cardio-vascular fitness, at health clubs and gymnasiums or in the privacy of their own homes. Elliptical running machines include footpads affixed to support members that may move both back and forth and up and down to accommodate a walking or running motion by the exerciser. Elliptical running machines

provide high-intensity, low-impact exercise because the feet never leave the footpads. Impact forces in the feet are decreased relative to traditional running or jogging (even on treadmills), resulting in fewer orthopedic injuries to the ankles, knees and hips. The exerciser's feet are typically guided through the exercise movement with large, stable footrests. These movements are designed for aerobic benefit, and the resistance of the support members can be adjusted to be easy enough for someone just starting out, and challenging enough for a more seasoned athlete.

However, known elliptical running machines suffer from a number of shortcomings. First, the stride length is typically nonadjustable, and is determined by the placement of the footrests and the lengths of the support members. While generally positioned to be optimal for exercisers of average height, the predetermined stride length may be uncomfortable or even hazardous for those exercisers having heights substantially taller or shorter than average.

Second, known elliptical running machines only allow for exercisers to mimic walking and running motions. The elliptical machines cannot be used to provide non-impact emulations of other exercises, such as skiing or skating.

Therefore, there exists a need for improved elliptical exercise machines that will emulate exercises more complex than running, such as skiing and/or skating. The present invention addresses this need.

SUMMARY OF THE INVENTION

The present invention relates to an improved elliptical crosstraining apparatus wherein the footrest support members are functionally decoupled from one another. One object of the present invention is to provide an improved elliptical crosstraining apparatus. Related objects and advantages of the present invention will be apparent from the following description.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a first embodiment elliptical crosstraining apparatus of the present invention.

FIG. 2 is a top plan view of a flat contact surface portion of the embodiment of FIG. 1.

FIG. 3 is a partial side cut-away view of a support member of FIG. 1.

FIG. 4A a partial bottom plan view of a support member of FIG. 1.

FIG. 4B a partial bottom plan view of an alternate support member of FIG. 4A having multiple bearings.

FIG. 5 is a partial top plan view of FIG. 1.

FIG. 6 is a partial top plan view of a support member of FIG. 5.

FIG. 7A is a partial side cutaway view of FIG. 6.

FIG. 7B is a partial side cutaway view of an alternate support member of FIG. 7A.

FIG. 8 is a perspective view of a second embodiment elliptical crosstraining apparatus of the present invention.

FIG. 9 is a top plan view of a flat contact surface portion of the embodiment of FIG. 8.

FIG. 10 is an enlarged partial side elevational view of a support member and the flat contact portion of FIG. 8.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

For the purposes of promoting an understanding of the principles of the invention and presenting its currently understood best mode of operation, reference will now be made to the embodiments illustrated in the drawings and specific language will be used to describe the same. It will nevertheless be understood that no limitation of the scope of the invention is thereby intended, with such alterations and further modifications in the illustrated device and such further applications of the principles of the invention as illustrated therein being contemplated as would normally occur to one skilled in the art to which the invention relates.

FIGs. 1-7B illustrate a first embodiment of the present invention, an elliptical crosstraining exercise apparatus 100 having non-coupled, independently operable footrest support members 102. The footrest support members 102 extend from a central mechanical unit or gearbox 104 (such as a set of cranks rotatable about respective independently pivoting armatures with respective linkages for connection with the respective footrest support members 102) such that the resistance and travel path of the footrest support members 102 is governed by the central mechanical unit 104. Preferably, the resistance on the footrest support members 102 is variable.

Each footrest support member 102 has a distal end 106 and a proximal end 108 and further includes a contact portion 110 positioned at the distal end 106. In this embodiment, the contact portion 110 is one or more ball bearing operationally connected to the distal end 106, such that the contact portion 110 is relatively free to rotate relative to the footrest support member 102.

The contact portion 110 is configured to movably contact a flat contact surface member 114. The flat contact surface member 114 preferably includes a first plurality of grooves or races 116 formed thereinto and sized to accept the contact portion 110 in rolling cooperation. The flat contact surface member 114 also preferably includes a second plurality of grooves or races 118 formed thereinto, sized to accept the contact portion 110 in rolling cooperation, and preferably oriented perpendicularly to the first plurality of races 116. In other words, the first and second plurality of races 116, 118 preferably form a two-dimensional grid (i.e., a grid defined by a first and a second non-colinear axis, wherein the axes are preferably orthogonally oriented respective to each other) determining the possible travel pathways of each bearing, and thus of each footrest support member 102. It is thus possible for each footrest support member 102 to be moved along one or both axes; it is further possible for both footrest support members 102 to be moved within over the two dimensional surface member 114 independently of the other respective support member 102.

The flat contact surface member 114 is preferably angled (relative the horizontal surface the apparatus rests upon) to provide an incline for the footrest support members 102 to traverse. More preferably, the contact angle between the flat surface contact member 114 and the horizontal is variable. In other words, the flat surface contact member 114 is preferably movably connected to the body of the apparatus 100. Also preferably, the flat support surface member 114 includes siderails 120 to prevent the contact portions 110 from moving beyond the flat support surface 114.

Preferably, valve members 122 may be operably connected to the races 116, 118 to limit or restrict the pathways available to the contact portions 110.

Also preferably, the footrest support members 102 are of variable length. In one embodiment, each footrest support member 102 includes a first portion 126 extending

from the central mechanical unit 104 and a second portion 128 (preferably lockingly) connectable to the first portion 126 and extending to the flat surface contact member 114. The first and second portions 126, 128 connect at a joint 130. The joint 130 is preferably formed by the connection of a protrusion 132 formed at the joining end of one portion 126, 128 and one of a plurality of recesses 134 sized to accept the protrusion 132 and formed in the other member 128, 126. (See FIG. 7A.) Preferably, the protrusion 132 includes a latching portion 136, such as a spring biased wheel or ball. More preferably, the protrusion 132 is positioned to extend downwardly into its matching recess 134. Alternately, the end of one portion 126, 128 may include a plurality of apertures 140 formed therethrough and be sized to slip into the hollow end of the other portion 128, 126, which also includes at least one aperture 140 formed therethrough. (See FIG. 7B.) One or more pins 142 may be slipped through both portions when the apertures 140 are aligned to form a joint 130.

Preferably, a detachable biasing member 146, such as an elastic strap or a spring, extends between the two footrest support members 102 to couple the footrest support members 102 to help facilitate the emulation of running. Removal of the biasing member 146 decouples the support members, enabling the apparatus 100 to emulate such exercises as skiing or skating.

FIGs. 8-10 describe a second embodiment exercise apparatus 200 of the present invention. The second embodiment apparatus 200 is similar to the first embodiment described above, with the exception that the flat support surface member 214 includes an array of rotatable contact members 250 (such as ball bearings) coupled thereto and the contact surfaces 210 of the footrest support members 202 are substantially flat. The contact surfaces 210 intersect the array of rotatable contact members 210 (ball bearings) to relatively freely rollably move over the flat support surface member 214.

While the invention has been illustrated and described in detail in the drawings and foregoing description, the same is to be considered as illustrative and not restrictive in character. It is understood that the embodiments have been shown and described in the foregoing specification in satisfaction of the best mode and enablement requirements. It is understood that one of ordinary skill in the art could readily make a nearly infinite number of insubstantial changes and modifications to the above-described embodiments and that it would be impractical to attempt to describe all such embodiment variations in the present specification. Accordingly, it is understood that all changes and modifications that come within the spirit of the invention are desired to be protected.